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EXAMINER	
PHAM, THAI V	

ART UNIT	PAPER NUMBER
2192	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/686,418	CZERWONKA, JACEK A.	
	Examiner	Art Unit	
	Thai Van Pham	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☒ Claim(s) *5,16 and 21-23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/14/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This is the initial office action based on the application filed on October 14, 2003.

Priority date that has been considered for this application is October 14, 2003.

Claims 1 – 23 are currently pending and have been considered below.

Claim Objections

1. Claims 5, 16, and 21 – 23 are objected to because of typographical errors.

-- Claim 5: the number "*4*" is mistyped as "*2*": "*The method of claim ~~2~~ 4 wherein...* ".

-- Claim 16: the word "*precondition*" is mistyped as "*constraint*" in: "*...evaluating a precondition ...that test case matches the ~~constraint~~ precondition, and if so...* ".

-- Claim 21: the number "*20*" is mistyped as "18". "*The system of claim ~~18~~ 20 wherein the tiebreaker ...* ".

-- Claims 22 and 23: the word "*system*" is mistyped as "*method*". "*The ~~method~~ system of claim ...* ".

Appropriate corrections are required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claim 13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

-- Claim 13: recites "*a computer-readable medium*" that may include a signal such as a carrier wave (Specification, page 10: lines 3 – 24; "*...computer-readable media may comprise computer storage media and communication media ...communication media typically embodies computer-readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave...*").

A product is a tangible physical article or object, some form of matter, which a signal is not. That the other product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of U.S.C. 101. (See Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (See Interim Guidelines for Examination of Patent Applications for Patent Subject Matter, Eligibility (OG Cite: 1300 OG142), Annex IV(c)).

In the principle of compact prosecution, Examiner anticipates the claim will be amended to become statutory claim as such "*A ~~computer-readable~~ computer storage medium having computer-executable instructions...* ".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 23 are rejected under 35 U.S.C. 102(b) as being anticipated by **Briand et al.** (NPL: A UML-Based Approach to System Testing).

-- Claim 1.

Briand discloses, *in a computing environment, a method comprising*:

• *receiving an original model comprising a plurality of elements representing operations to test*;

(Page 11, left column; "...*testability*: The degree to which a model (in our case, a UML diagram) has sufficient information to allow automatic generation of test cases... ". The model is in the form of Unified Modeling Language (UML) diagram.

Page 11: Overview of the TOTEM System Test Methodology; "Use case diagram", "Use case descriptions", "Sequence or collaboration diagrams for each use case". The plurality of elements are in the form of use cases.)

• *producing a plurality of subsequences from the elements, each subsequence corresponding to at least two elements*; and

(Fig. 1 – A2, A5 and associated text, e.g., page 12: "3.1 Generating Use Case Sequences". A test sequence contains at least two use cases.)

• *generating a suite of test cases from the subsequences, such that any valid subsequence appears at least once among the test cases in the suite.*

(Fig. 1, A7 and associated text, e.g., page 12; "...A7 and A8 are concerned with generating the test cases and code for oracles... ". The generated test cases cover all the sequences of the use cases.)

-- Claim 2.

Briand discloses *the method of claim 1 further comprising*:

• *evaluating a constraint against the test cases to determine for each test case whether that test case matches the constraint.*

(Fig. 2 and associate text, e.g., pages 12 – 13: "3.1.1 Representation of Use Case Sequential Dependencies"; "...the vertices are use cases and the edges are sequential dependencies between the use cases... ".)

-- Claim 3.

Briand discloses *the method of claim 2, wherein the constraint matches a selected test case, and further comprising*:

• *splitting the test case into at least two test cases.*

(Figs. 4 and 5, page 16: "Directed graph corresponding to activity diagram" and "Tree derived from directed graph". At node D, use case activities are split into B, F, and E. The test cases corresponding to the split use case sequences are generated accordingly.)

-- Claim 4.

Briand discloses *the method of claim 1 further comprising*:

• *evaluating a precondition against the test cases to determine for each test case whether that test case matches the precondition.*

(Fig. 2 and associate text, e.g., pages 12 – 13: "3.1.1 Representation of Use Case Sequential Dependencies"; "...the vertices are use cases and the edges are sequential dependencies between the use cases... ".)

-- Claim 5.

Briand discloses *the method of claim 2, wherein the precondition matches a selected test case, and further comprising*:

• *splitting the test case into at least two test cases.*

(Figs. 4 and 5, page 16: "Directed graph corresponding to activity diagram" and "Tree derived from directed graph". At node D, use case activities are split into B, F, and E. The test cases corresponding to the split use case sequences are generated accordingly.)

-- Claim 6.

Briand discloses *the method of claim 1, wherein a plurality of preconditions is known, and further comprising*:

• *sorting the preconditions into an order*, and

(Fig. 4 – "Directed graph" and associated text, e.g., page 16; "...a directed graph can be derived by transforming join and fork synchronizations into regular edges ...Those paths represent possible sequences of parameterized use cases that can be executed... ". The preconditions are sorted in order of execution sequence.)

• *evaluating each precondition against the test cases based on the order to determine for each test case whether that test case matches the precondition.*

(Tables 1 and 2 – "use case sequences" – and associated text, e.g., pages 17 – 18. The test cases contain sequences of use cases according to the execution order prescribed in the preconditions.)

-- Claim 7.

Briand discloses *the method of claim 1, wherein generating a suite of test cases from the subsequences comprises*:

• *selecting a subsequence based on a selection algorithm*, and

(Page 12: "Generating Use Case Sequences" and associated text; "...principles underlying the representation and generation of possible use case test sequences... ". Appendix H: "...algorithms for the production of complete use case sequences to be tested from the activity diagram describing use case sequential dependencies and test scale information ... ".)

• *adding the selected subsequence to a test case.*

(Page 14: "Generation of Use Case Sequences"; "...The combination of instantiated use case sequences ... ".)

-- Claim 8.

Briand discloses *the method of claim 7 further comprising*:

• *marking the selected subsequence as covered.*

(Pages 17 – 18: Generation of "interleaving" sequences. When use case sequences are generated by combining use cases, the combined uses cases are implicitly kept track as already been covered.)

-- Claim 9.

Briand discloses *the method of claim 8 further comprising*:

• *selecting another subsequence from a set of uncovered subsequences*, and

(Page 14: "Generation of Use Case Sequences"; "...The combination of instantiated use case sequences ... ".)

• *adding the other subsequence to the test case.*

(Table 2: "interleaving instantiated sequences". Combinations of use cases are computed.)

-- Claim 10.

Briand discloses *the method of claim 8 wherein selecting a subsequence based on a selection algorithm comprises*:

• *determining which element starts a largest number of still uncovered subsequences,* and

(Page 20: "3.2.3 Specifying Operation Sequences"; "...identify the precise operation sequences to be executed for each term ...The iteration is bypassed (for * only), performed once, an intermediary number of times (possibly a statistical median if available), and a maximum M number of times ... ". Looking at Figs. 4, 5 and "regular expressions" illustration of "3.2.2 Expressing Sequence Diagram as Regular Expressions", the elements are implicitly ordered form largest number of operations (i.e., uncovered subsequences) by a * and explicit numbers of iterations.)

• *selecting a subsequence starting with that element.*

(Pages 20 – 21: "3.2.3 Specifying Operation Sequences". The number of iterations of a use case is assigned in the use case sequence.)

-- Claim 11.

Briand discloses *the method of claim 8 wherein selecting a subsequence based on a selection algorithm comprises*:

• *determining which element starts a largest number of still uncovered subsequences*, and

(Page 20: "3.2.3 Specifying Operation Sequences"; "...identify the precise operation sequences to be executed for each term ...The iteration is bypassed (for * only), performed once, an intermediary number of times (possibly a statistical median if available), and a maximum M number of times ... ". Looking at Figs. 4, 5 and "regular expressions" illustration of "3.2.2 Expressing Sequence Diagram as Regular Expressions", the elements are implicitly ordered form largest number of operations (i.e., uncovered subsequences) by a * and explicit numbers of iterations.)

• *if there is only one such an element, selecting a subsequence starting with that element*, and

(Pages 20 – 21: "3.2.3 Specifying Operation Sequences". The number of iterations of a use case is assigned in the use case sequence.)

• *if there is a tie, employing a tiebreaker.*

(Pages 20 – 21: "3.2.3 Specifying Operation Sequences". Use cases with equal number of iterations are chosen and assigned equally in terms of execution priority.)

-- Claim 12.

Briand discloses *the method of claim 1 wherein generating a suite of test cases from the subsequences comprises*:

• *selecting a subsequence*,

(Page 12: "Generating Use Case Sequences" and associated text; "...principles underlying the representation and generation of possible use case test sequences... ". Appendix H: "...algorithms for the production of complete use case sequences to be tested from the activity diagram describing use case sequential dependencies and test scale information ... ".)

• *adding the selected subsequence to a test case*,

(Page 14: "Generation of Use Case Sequences"; "...The combination of instantiated use case sequences ... ".)

• *marking the selected subsequence as covered*, and

(Pages 17 – 18: Generation of "interleaving" sequences. When use case sequences are generated by combining use cases, the combined uses cases are implicitly kept track as already been covered.)

• *repeating until no subsequence remains uncovered.*

(page 23: "3.3 Generating Variant Sequences". "...one variant corresponds to a possible path realization condition for on of the product terms in the interaction diagram regular expressions. A variant may require several test cases ... ". All use cases are covered under generated variant sequences.)

-- Claim 13: is a computer product claim for performing a method corresponding to the method of claim 1; Therefore, claim 13 is rejected for the same reason set forth in connection to the rejection of claim 1 above.

Examiner's Note on Claims 14 – 23: it appears that the Applicant is attempting to invoke 35 U.S.C. 112, 6th paragraph, with the use of means-plus-function language in claim 14 – 17. The specification does not provide any specific or special physical structure(s) for the features that could be read into the claim to limit the scope of the means to perform the claimed functions. The specification, however, discloses that all the "means for receiving... ", "means for producing ... ", "means for generating ... ", "evaluation means ... ", and "means for counting ... " can be performed by "a general purpose computing device in the form of a computer" (page 9: lines 11 – 13). Therefore, Examiner considers the system of claim 14 – 23 to be a general-purpose computer system for performing the method similar to that of claims 1 – 12.

-- Claims 14, 15, 16, and 17:

Briand discloses an apparatus (Fig. 2 – system used by the librarian – associated text. Abstract: "...testing an entire system ...In the context of object-oriented, UML development...") for performing a method corresponding to the method of claims 1, 2 and 3, 4 and 5, and 10.

-- Claims 18 – 23:

Briand discloses an apparatus (Fig. 2 – system used by the librarian – associated text. Abstract: "...testing an entire system ...In the context of object-oriented, UML development...") for performing a method corresponding to the method of claims 1 and 12, 2 – 5, 11, 7 and 8.

Conclusion

The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. See the attached Notice of References Cited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai Van Pham whose telephone number is (571) 270-1064. The examiner can normally be reached on Monday - Thursday, 8am - 3pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TVP

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SUPERVISORY PATENT EXAMINER